Streambank Protection Project
Machias River
Machias, Maine

Operation and Maintenance Manual

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US Army Corps of Engineers
New England Division

OPERATION AND MAINTENANCE MANUAL
EMERGENCY STREAMBANK PROTECTION PROJECT
MACHIAS RIVER
MACHIAS, MAINE

FOREWORD

The Machias streambank protection project, consisting of stone slope protection, was designed and constructed to stabilize the streambank along the Machias River and prevent further erosion of the municipal parking lot. The successful functioning of the streambank stabilization works is not assured solely by the construction of the stone protection along the streambank since the forces of nature, in this case, very high turbulent flows and ice jams continuously attack the project area. If the system is to perform the functions for which it was designed, it must be carefully maintained not only during periods of normal flow stages, but also during subsequent flood periods.

The purpose of this manual is to provide information regarding actual maintenance procedures and outline the responsibilities of the parties involved. In general, the regulations designate non-Federal interests as having responsibility for operation and maintenance of the project. Therefore, the town of Machias should assure that several local individuals be familiar with this project and have a thorough understanding of the recommended methods of maintaining the system.

The general flood control Regulations for Operation and Maintenance of Flood Control Works quoted herein were approved by the acting Secretary of War on August 9, 1944. Established by the Department of Defense, the improvement of rivers and harbors and other waterways for flood control and other purposes, formerly under jurisdiction of the Secretary of War, became the responsibility of the Secretary of the Army. References herein to the Secretary of War and War Department shall be construed to mean, respectively, the Secretary of the Army and the Department of the Army. Where reference is made to the District Engineer in the Regulations included in this manual, it shall be construed to mean the Division Engineer, New England Division, Corps of Engineers.

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SECTION I

INTRODUCTION

1. AUTHORIZATION

The construction of the streambank stabilization project along the Machias River in the town of Machias, Maine, was authorized by the Chief of Engineers on July 29, 1986, pursuant to the authority contained in Section 14 of the 1946 Flood Control Act, as amended.

2. LOCATION

The town of Machias is a coastal community, located in "down east" Maine, about 83 miles east of Bangor, Maine and 22 miles south of Calais, Maine. The project site, adjacent to a municipal parking lot, is situated along the north bank of the Machias River, near the base of the Machias Falls. The Machias River discharges into a tidal reach just below the falls.

3. DESCRIPTION OF DAMAGE

The problem area involved streambank erosion along the banks of the Machias River, adjacent to a municipal parking lot. Serious erosion problems had occurred at this site, which was exposed to very high turbulent flows from the falls particularly during flood periods. Another contributing factor was the impact of ice blocks driven against the embankment by the high river currents in the spring and late winter. Furthermore, the deteriorating dam at the head of the falls had somewhat redirected normal flows in the area, thus, aggravating the problem.

In 1973, the Federal Disaster Assistance Administration (FDAA) dumped riprap along the riverbank following a severe storm. This provided short-term protection but storms in February and April of 1976 resulted in the partial destruction of this riprap.

4. DESCRIPTION OF PROJECT

The streambank stabilization project consists of a 5-foot layer of stone protection (maximum weight: 5500 pounds) placed on a 2-foot layer of stone bedding (maximum weight: 40 pounds) and a 1-foot layer of gravel bedding, constructed on a slope of 2 horizontal to 1 vertical. The stone protection provides adequate protection for the 250 feet of streambank adjacent to the municipal parking lot. Guardrails have been placed along the top edge of the stone protection to eliminate encroachment from the parking area.

5. PROTECTION PROVIDED

The streambank stabilization was designed and constructed to prevent further erosion along the north bank of the Machias River and to maintain the integrity of the parking lot area.

6. CONSTRUCTION HISTORY

The project was constructed by Thomas DiCenzo of Calais, Maine during the period from December, 1986 to February, 1987 at a cost of $115,000.

7. ASSURANCES OF LOCAL COOPERATION

The Army Corps of Engineers and the town of Machias entered into a local cooperation agreement for this streambank stabilization project on August 21, 1986. The agreement provides for the town to, among other required responsibilities, maintain the project after its completion without cost to the Federal Government. A copy of the formalized local assurances is included as Appendix B.

8. PLANS

A reduced size drawing showing the project as actually constructed is included as Appendix D.

SECTION II

GENERAL REGULATIONS

9. PURPOSE OF THIS MANUAL

The purpose of this manual is to present detailed information to be used as a guide in complying with "Flood Control Regulations - Maintenance and Operation of Flood Control Works" as approved by the Acting Secretary of War on August 9, 1944, and published in this volume as Appendix A. In executing assurances of local cooperation, the town of Machias has agreed to maintain and operate the completed works in accordance with these regulations. The regulations which are intended to cover all local protection projects constructed by the Department of the Army throughout the United States are general in nature, and obviously cannot give detailed instructions for the maintenance and operation of a specific project. The details set forth in this manual for maintenance and operation for the Machias project are intended to supplement the regulations to permit obtaining all the benefits and protection against erosion for which the project was designed. Failure to maintain and operate the project as required by the regulations and as detailed herein could cause property losses and could result in an irreparable loss of confidence in the bank protection system.

10. GENERAL RULES AND REGULATIONS

Paragraph 208.10 (a) of the regulations prescribed by the Secretary of War gives general rules for the maintenance and operation of structures and facilities constructed by the United States for local protection. Applicable portions are quoted below to avoid the necessity for cross reference and are further defined by remarks under each quotation.

"(1) The structures and facilities constructed by the United States for local flood protection shall be continuously maintained in such a manner and operated at such times and for such periods as may be necessary to obtain the maximum benefits;"

These requirements cannot be overstressed, and the town authorities must make adequate provisions for funds, personnel, equipment and materials to allow for the proper maintenance and operation of the streambank protective works.

"(2) The State, political subdivision thereof, or other responsible local agency, which furnished assurance that it will maintain and operate flood control works in accordance with the regulations prescribed by the Secretary of War, as required by law, shall appoint a permanant committee consisting of or headed by an official hereinafter called the "Superintendent", who shall be responsible for the development and maintenance of, and directly in charge of, an organization responsible for the efficient operation and maintenance of all of the structures and facilities during flood periods and for continuous inspection and maintenance of the project works during periods of low water, all without cost to the United States;"

The committee should be composed of competent members, preferably persons experienced in engineering or construction works. The committee must be given broad authority to carry out its responsibilities. The name, address and office and home telephone numbers of the Superintendent, and any changes thereof, shall be promptly furnished to the Division Engineer, New England Division, Corps of Engineers.

(3) N/A

"(4) No encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the right-of-ways for the protective facilities;"

Right-of-ways and easements have been established for which access to the project can be provided in order to allow equipment which may be necessary to perform the maintenance of the project. These right-of-ways are essential and must be kept open at all times.

"(5) No improvement shall be passed over, under, or through the walls, levees, improved channels or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-ways, nor shall any change be made in any feature of the works without prior determination by the District Engineer of the War Department or his authorized representative that such improvement, excavation, construction, or alteration will not adversely affect the functioning of the protective facilities. Such improvements or alterations as may be found to be desirable and permissible under the above determination shall be constructed in accordance with standard engineering practice. Advice regarding the effect of proposed improvements or alterations on the functioning of the project and information concerning methods of construction acceptable under standard engineering practice shall be obtained from the District Engineer or, if otherwise obtained, shall be submitted for his approval. Drawings or prints showing such improvements or alterations as finally constructed shall be furnished the District Engineer after completion of the work;"

Any contemplated improvements or alterations as outlined above must be submitted to the U.S. Army Corps of Engineers, New England Division, Waltham, Massachusetts, and the approval of the Division Engineer obtained prior to the town authorizing the work. All requests for approval shall be in writing and complete drawings in duplicate. One set, which shall be in reproducible form, must be submitted along with a full description of the work intended. The town will be held responsible for obtaining prior approval from the Corps of Engineers for any improvements or alterations proposed by itself, private parties or any public parties. The town shall furnish the Division Engineer as-built drawings, in duplicate, of the completed work.

"(6) It shall be the duty of the Superintendent to submit a semi-annual report to the District Engineer covering inspection, maintenance, and operation of the protective works;"

See paragraph 13 of this SECTION for instructions on submitting reports.

"(7) The District Engineer or his authorized representatives shall have access at all times to all portions of the protective works;"

The Division Engineer or his representatives will make periodic inspections of the protective works to determine if the project is being properly maintained and operated by the town.

"(8) Maintenance measures or repairs which the District Engineer deems necessary shall be promptly taken or made;"

The town should maintain the facilities and keep them in good repair and not wait for the Division Engineer to call such matters to its attention. Upon request, the Division office will advise the town how to make any major repairs to the facilities.

"(9) Appropriate measures shall be taken by local authorities to insure that the activities of all local organizations operating public or private facilities connected with the protective works are coordinated with those of the Superintendent's organization during flood periods;"

The project is designed to provide bank stabilization and to protect the municipal parking lot against failure due to erosion. It does not provide protection against flooding and therefore, it may be necessary to curtail uses during periods of flooding.

"(10) The War Department will furnish local interests with an Operation and Maintenance Manual for each completed project, or separate useful part thereof, to assist them in carrying out their obligations under these regulations;"

The flood control committee should familiarize itself with the contents of this manual. The town authorities are encouraged to call on the Division Office of the Corps of Engineers for any additional advice or instructions required by them in carrying out the town's obligations for maintaining and operating the protection facilities.

11. MAINTENANCE

a. The word "maintenance" as used in this manual applies to the upkeep, repair, replacement and care of the work constructed by the United States and turned over to the town. If the maintenance is neglected there will be deterioration and possible failure in flood time.

b. Maintenance includes a regular walking inspection over the entire system. The purpose of the inspection is to detect any deterioration of project features that indicates a need for repair or replacement, and also to detect any restrictions in the stream, channel or floodway that reduces flow capacity.

12. OPERATION

a. The term "operation" as used in this manual, refers to the actual functions of the various features of the stone protection works during abnormal river stages.

b. When abnormal river stages are expected, it is important that the Superintendent make immediate decisions, take prompt action and have the authority to carry out his decisions to insure proper continued operation of the stone protection work.

c. To insure correct operation, the following items are considered to be essential:

(1) At least one person (preferably 2 or 3) be familiar with the protection works including the various types of materials comprising the streambank protection works.

(2) The sources of these materials should be established ahead of time. If possible a small amount of each type of material should be stockpiled nearby for quick use.

(3) Sufficient loading, hauling and placing equipment should be readily available for providing and placing the repair materials.

(4) Sufficient experienced personnel should be readily available for inspecting and performing the repair work.

13. REPORTS

a. The regulations prescribed by the Secretary of the Army call for semi-annual reports to be submitted by the Superintendent to the Division Engineer covering inspection and maintenance. Inspection of the protective facilities shall be made immediately prior to flood seasons, immediately following floods, and otherwise at intervals not exceeding 90 days as required by regulations.

b. To assist the Superintendent in making his inspection, a sample form is included in Appendix C. The Superintendent shall have additional copies printed for use in submitting his reports.

c. The semi-annual reports shall be submitted in triplicate to the Division Engineer each June and December. The reports will be submitted in letter form with copies of the inspection forms covering the inspections made during the period of the reports. The reports shall cover the following points:

(1) A description of the maintenance work performed in the preceding six months.

(2) The number and classification of men working on maintenance, regularly and intermittently.

(3) Description of any work performed by contract on the repair or improvements of the project.

SECTION III

STREAMBANK PROTECTION WORK

14. DESCRIPTION

The streambank stabilization work accomplished by the Army Corps of Engineers consists of construction of 250 feet of stone slope protection along the north bank of the Machias River adjacent to the municipal parking lot.

15. MAINTENANCE

Paragraph 208.10(g) (1) of the prescribed regulations sets forth rules for the maintenance of channels and floodways. These rules are quoted below, followed by brief comments where applicable to clarify these rules as they apply to the project.

"Channels and Floodways. - (1) Maintenance. - Periodic inspections of improved channels and floodways shall be made by the Superintendent to be certain that:"

"(i) The channel or floodway is clear of debris, weeds and wild growth;"

All debris and vegetative growth except grasses, at the protective work shall be removed promptly. Failure to remove shrub and tree growth could eventually lead to structural damage to the stone slope from the root systems.

"(ii) The channel or floodway is not being restricted by the depositing of waste materials, building of unauthorized structures or other encroachments;"

Dumping of waste materials or any types of encroachment on the protective work shall be prohibited and prompt steps shall be taken to remove or have removed any such encroachments.

"(iii) The capacity of the channel or floodway is not being reduced by the formation of shoals;"

Shoal areas should be removed, but care should be exercised that slopes of the channel and existing banks are not undercut or damaged. Existence of shoal areas will be apparent from inspections during time of low flow.

"(iv) Banks are not being damaged by rain or wave wash and that no sloughing of banks has occurred;"

Banks shall be inspected for damage by rain or wave wash or by sloughing and repaired promptly using materials similiar to that used in their original construction. Inspections shall be made at intervals not to exceed 90 days. Immediate steps will be taken to remedy any adverse conditions disclosed by such inspections.

"(v) Riprap sections are in good condition;"

The stone slope protection must be maintained in good condition to resist erosion. Any damage or loss of stone due to slides or vandalism must be promptly corrected. Periodic checks should be made of the stone slope protection to detect movement, damage or losses; and prompt corrective action should be taken. Such inspection shall be made at intervals not to exceed 90 days. Immediate steps will be taken to remedy any adverse conditions disclosed by such inspections.

(vi) N/A

16. OPERATION

Paragraph 208.10(g) (2) of the prescribed regulations gives rules for operation of channel and floodways. These rules are paraphased below with regard to the project.

(1) Operation. The bank of the stream along the project area shall be inspected during periods of high water and measures taken to protect those reaches being attacked by the current. The project shall be thoroughly inspected immediately following each major high water period. As soon as practicable thereafter, all snags and other debris shall be removed and all damage to the stone slope protection shall be repaired.

APPENDIX A

REGULATIONS PRESCRIBED BY THE SECRETARY OF THE ARMY

TITLE 33-NAVIGATION AND NAVIGABLE WATERS

Chapter II-Corps of Engineers War Department-Part 208-Flood Control Regulations Maintenance and Operation of Flood Control Works

(Retyped verbatim from original document)

Pursuant to the provisions of Section 3 of the Act of Congress approved June 22, 1936, as amended and supplemented (49 Stat. 1571; 50 Stat. 877; and 55 Stat. 638; 33 U.S.C. 701c; 701c-1), the following regulations are hereby prescribed to govern the maintenance and operation of flood control works:

208.10 *Local flood protection works; maintenance and operation of structures and facilities-* (a) *General.*

(1) The structures and facilities constructed by the United States for local flood protection shall be continuously maintained in such a manner and operated at such times and for such periods as amy be necessary to obtain the maximum benefits.

(2) The State, political subdivision thereof, or other responsible local agency, which furnished assurance that it will maintain and operate flood control works in accordance with the regulations prescribed by the Secretary of War, as required by law, shall appoint a permanant committee consisting of or headed by an official hereinafter called the "Superintendent", who shall be responsible for the development and maintenance of, and directly in charge of, an organization responsible for the efficient operation and maintenance of all of the structures and facilities during flood periods and for continuous inspection and maintenance of the project works during periods of low water, all without cost to the United States.

(3) A reserve supply of materials needed during a flood emergency shall be kept on hand at all times.

(4) No encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the rights-of-way for the protective facilities.

(5) No improvement shall be passed over, under, or through the walls, levees, improved channels or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-way, nor shall any change be made in any feature of the works without prior determination by the District Engineer of the War Department or his authorized representative that such improvement, excavation, construction, or alteration will not adversely affect the functioning of the protective facilities. Such improvements or alterations as may be found to be desirable and permissible under the above determination shall be constructed in accordance with standard engineering practice. Advice regarding the effect of proposed improvements or alterations on the functioning of the project and information concerning methods of construction acceptable under standard engineering practice shall be obtained from the District Engineer or, if otherwise obtained, shall be submitted for his approval. Drawings or prints showing such improvements or alterations as finally constructed shall be furnished the District Engineer after completion of the work.

(6) It shall be the duty of the Superintendent to submit a semi-annual report to the District Engineer covering inspection, maintenance, and operation of the protective works.

(7) The District Engineer or his authorized representatives shall have access at all times to all portions of the protective works.

(8) Maintenance measures or repairs which the District Engineer deems necessary shall be promptly taken or made.

(9) Appropriate measures shall be taken by local authorities to insure that the activities of all local organizations operating public or private facilities connected with the protective works are coordinated with those of the Superintendent's organization during flood periods.

(10) The War Department will furnish local interests with an Operation and Maintenance Manual for each completed project, or separate useful part thereof, to assist them in carrying out their obligations under these regulations.

(b) *Levees* - (1) *Maintenance.* The Superintendent shall provide at all times such maintenance as may be required to insure serviceability of the structures in time of flood. Measures shall be taken to promote the growth of sod, exterminate burrowing animals, and to provide for routine mowing of the grass and weeds, removal of wild growth and drift deposits, and repair of damage caused by erosion or other forces. Where practicable, measures shall be taken to retard bank erosion by planting of willows or other suitable growth areas riverward of the levees. Periodic inspections shall be made by the Superintendent to insure that the above maintenance measures are being effectively carried out and further, to be certain that:

(i) No unusual settlement, sloughing, or material loss of grade or levee cross-section has taken place;

(ii) No caving has occurred on either the land side or the river side of the levee which might affect the stability of the levee section;

(iii) No seepage, saturated areas, or sand boils are occurring;

(iv) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged;

(v) Drains through the levees and gates on said drafters are in good working condition;

(vi) No revetment work or riprap has been displaced, washed out, or removed;

(vii) No action is being taken, such as burning grass and weeds during appropriate seasons, which will retard or destroy the growth of the sod;

(viii) Access roads to and on the levee are being properly maintained;

(ix) Cattle guards and gates are in good condition;

(x) Crown of levee is shaped so as to drain readily, and roadway thereon, if any, is well shaped and maintained;

(xi) There is no unauthorized grazing or vehicular traffic on the levees;

(xii) Encroachments are not being made on the levee right-of-way which might endanger the structure or hinder its proper and efficient functioning during times of emergency.

Such inspections shall be made immediately prior to the beginning of the flood season; immediately following each major high water period, and otherwise at intervals not exceeding 90 days, and such immediate times as may be necessary to insure the best possible care of the levee. Immediate steps will be taken to cor-

rect dangerous conditions disclosed by such inspections. Regular maintenance repair measures shall be accomplished during the appropriate season as scheduled by the Superintendent.

(2) *Operation.* During flood periods the levee shall be patrolled continuously to locate possible sand boils or unusual wetness of the landward slope and to be certain that:

(i) There are no indications of slides or sloughs developing;

(ii) Wave wash or scouring action is not occurring;

(iii) No low reaches of levee exist which may be overtopped;

(iv) No other conditions exist which might endanger the structure.

Appropriate advance measures will be taken to insure the availability to adequate labor and materials to meet all contingencies. Immediate steps will be taken to control any condition which endangers the levee and to repair the damaged section.

(c) *Flood walls* - (1) *Maintenance.* Periodic inspections shall be made by Superintendent to be certain that:

(i) No seepage, saturated areas, or sand boils are occurring;

(ii) No undue settlement has occurred which affects the stability of the wall or its water tightness;

(iii) No trees exist, the roots of which might extend under the wall & offer accelerated seepage paths;

(iv) The concrete has not undergone cracking, chipping, or breaking to an extent which might affect the stability of the wall or its water tightness;

(v) There are no encroachments upon the right-of-way which might endanger the structure or hinder its functioning in time of flood;

(vi) Care is being exercised to prevent accumulation of trash and debris adjacent to walls, and to insure that no fires are being built near them;

(vii) No bank caving conditions exist riverward of the wall which might endanger its stability;

(viii) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged.

Such inspections shall be made immediately prior to the beginning of the flood season, immediately following each major high water period, and otherwise at intervals not exceeding 90 days. Measures to eliminate encroachments and effect repairs found necessary by such inspections shall be undertaken immediately. All repairs shall be accomplished by methods acceptable in standard engineering practice.

(2) *Operation.* Continuous patrol of the wall shall be maintained during flood periods to locate possible leakage at monolith joints or seepage underneath the wall. Floating plant or boats will not be allowed to lie against or tie up to the wall. Should it become necessary during a flood emergency to pass anchor cables over the wall, adequate measures shall be taken to protect the concrete and construction joints. Immediate steps shall be taken to correct any conditions which endangers the stability of the wall.

(d) *Drainage structures* - (1) *Maintenance.* Adequate measures shall be taken to insure that inlet and outlet channels are kept open and that trash, drift, or debris is not allowed to accumulate near drainage structures. Flap gates and manually operated gates and valves on drainage structures shall be examined, oiled, and trial operated at least once every 90 days. Where drainage structures are provided with stop log or other emergency closures, the condition of the equipment and its housing shall be inspected regularly and a trial installation of the emergency closure shall be made at least once each year. Periodic inspections shall be made by the Superintendent to be certain that:

(i) Pipes, gates, operating mechanisms, riprap, and headwalls are in good condition;

(ii) Inlet and outlet channels are open;

(iii) Care is being exercised to prevent the accumulation of trash and debris near the structures in that no fires are being built near bituminous coated pipes;

(iv) Erosion is not occurring adjacent to the structures which might endanger its water tightness or stability.

Immediate steps will be taken to repair damage, replace missing or broken parts, or remedy adverse conditions disclosed by such inspections.

(2) *Operation.* Whenever high water conditions impede, all gates will be inspected a short time before water reaches the invert of the pipe and any object which might prevent closure of the gate shall be removed. Automatic gates shall be closely observed until it has been ascertained that they are securely closed. Manually operated gates and valves shall be closed as necessary to prevent inflow of flood water. All drainage structures and levees shall be inspected frequently during floods to ascertain whether seepage is taking place along the lines of their contact with the embankment. Immediate steps shall be taken to correct any adverse conditions.

(e) *Closure structures* - (1) *Maintenance.* Closure structures for the traffic openings shall be inspected by the Superintendent every 90 days to be certain that:

(i) No parts are missing;

(ii) Metal parts are adequately covered with paint;

(iii) All moveable parts are in satisfactory working order;

(iv) Proper closure can be made promptly when necessary;

(v) Sufficient materials are on hand for the erection of sandbag closures and that the location of such materials will be readily accessible in times of emergencies.

Tools and parts shall not be removed for other use. Trial erections of one or more closure structures shall be made once each year, alternating the structures chosen so that each gate will be erected at least once in each three-year period. Trial erections of all closure structures shall be made whenever a change is made in key operating personnel. Where railroad operation makes trial erection of a closure structure in feasible, rigorous inspection and drill of operating personnel may be substitute therefore. Trial erection of sandbag closures is not required. Closure materials will be carefully checked prior to and following flood periods, and damaged or missing parts shall be repaired or replaced immediately.

(2) *Operation.* Erection of each moveable closure shall be started in sufficient time to permit completion before flood waters reach the top of the structure sill. Information regarding the proper method of erecting each individual closure structure, together with an estimate of the time required by an experienced crew to complete its erection will be given in the Operation and Maintenance

Manual which will be furnished local interests upon completion of the project. Closure structures will be inspected frequently during flood periods to ascertain that no undue leakage is occurring and that drains provided to care for the ordinary leakage are functioning properly. Boats or floating plant shall not be allowed to tie up to closure structures or to discharge passengers or cargo over them.

(f) *Pumping plants* - (1) *Maintenance.* Pumping plants shall be inspected by the Superintendent at intervals not to exceed 30 days during flood seasons and 90 days during off-flood seasons to insure that all equipment is in order for instant use. At regular intervals, proper measures shall be taken to provide for cleaning plant, buildings, and equipment, repainting as necessary, and lubricating all machinery. Adequate supplies of lubricants for all types of machine, fuel for gasoline or diesel powered equipment, and flashlights or lanterns for emergency lighting shall be kept on hand at all times. Telephone service shall be maintained at pumping plants. All equipment, including switch gear, transformers, motors, pumps, valves, and gates shall be trial operated and checked at least once every 90 days. Megger tests of all insulation shall be made whenever wiring has been subject to undue dampness and otherwise at intervals not to exceed one-year period. A record shall be kept showing the results of such test period. Wiring disclosed to be in an unsatisfactory condition by such tests shall be brought to a satisfactory condition or shall be properly replaced. Diesel and gasoline engines shall be started at such intervals and allowed to run for such length of time as may be necessary to insure their service ability in times and emergencies. Only skilled electricians and mechanics shall be employed on test and repairs. Operating personnel for the plant shall be present during tests. Any equipment removed from the station for repair or replacement shall be repaired or replaced as soon as practible and shall be trial operated after reinstallation. Repairs requiring removal of equipment from the plant shall be made during off-flood seasons insofar as practicable.

(2) *Operation.* Competent operators shall be on duty at pumping plants whenever it appears that necessity for pump operation is imminent. The operator shall thoroughly inspect, trial operate, and place in readiness all plant equipment. The operator shall be familiar with the equipment manufacturers' instructions and drawings and with the "Operating Instructions" for each station. The equipment shall be operated in accordance with the above hyphened mentioned "Operation Instructions" and care shall be exercised that proper lubrication is being supplied all equipment, and that no overheating, undue vibration or noise is occurring. Immediately upon final recession of flood waters, the pumping station shall be thoroughly cleaned, pumphouse sumps flushed, and equipment thoroughly inspected, oiled and greased. A record or log of pumping plant operation shall be kept for each station, a copy of which shall be furnished to the District Engineer following each flood.

(g) *Channels and Floodways* - (1) *Maintenance.* Periodic inspections of improved channels and floodways shall be made by the Superintendent to be certain that:

(i) The channel or floodway is clear of debris, weeds, and wild growth;

(ii) The channel or floodway is not being restricted by the depositing of waste material, building of unauthorized structures or encroachments;

(iii) The capacity of the channel or floodway is not being reduced by the formation of shoals;

(iv) Banks are not being damaged by rain or wave wash, and that no sloughing of banks has occurred;

(v) Riprap sections and deflection dikes and walls are in good condition;

(vi) Approach and egress channels adjacent to the improved channel or floodway are sufficiently clear of obstructions and debris to permit proper functioning of the project works.

Such inspections shall be made prior to the beginning of the flood season and otherwise intervals not to exceed 90 days. Immediate steps will be taken to remedy any adverse conditions disclosed by such inspections. Measures will be taken by the Superintendent to promote the growth of grass on bank slopes and earth deflection dikes. The Superintendent shall provide for periodic repair and cleaning of debris basins, check dams, and related structures as may be necessary.

(2) *Operations.* Both banks of the channel shall be patrolled during periods of high waters and measures shall be taken to protect those reaches being attacked by the current or by wave wash. Appropriate measures shall be taken to prevent the formation of jams of ice or debris. Large objects which become lodged against the bank shall be removed. The improved channel or floodway shall be thoroughly inspected immediately following each major high water period. As soon as practicable thereafter, all snags and other debris shall be removed and all damage to the banks, riprap, deflection dikes and walls, drainage outlets, or other flood control structures repaired.

(h) *Miscellaneous Facilities* - (1) *Maintenance.* Miscellaneous structures and facilities constructed as part of the protective works and other structures and facilities which function as a part of, or affect the efficient functioning of the protective works, shall be periodically inspected by the Superintendent and the appropriate maintenance measures taken. Damaged or unserviceable parts shall be repaired or replaced without delay. Areas used for ponding in connection with pumping plants or for temporary storage of interior runoff during flood period shall not be allowed to become filled with silt, debris, or dumped material. The Superintendent shall take proper steps to prevent restriction of bridge openings and, where applicable, shall provide temporary raising during floods of bridges which restrict channel capacities during high flows.

(2) *Operation.* Miscellaneous facilities shall be operated to prevent or reduce flooding during periods of high water. Those facilities constructed as part of the protective works shall not be used for purposes other than flood protection without approval of the District Engineer unless designed therefore.

(49 Stat. 1571, 50 Stat. 877; and 55 Stat. 638; 33 U.S.C. 701c; 701c-1) (Regs. 9 August 1944, CE SPEWF)

[SEAL] J.A. ULIO
Major General
The Adjutant General

[F.R. Doc 44-12255; Filed,

APPENDIX B

ASSURANCES OF LOCAL COOPERATION

AGREEMENT BETWEEN

THE UNITED STATES OF AMERICA

AND

THE TOWN OF MACHIAS

FOR LOCAL COOPERATION AT THE

EMERGENCY STREAMBANK PROTECTION PROJECT

MACHIAS RIVER

MACHIAS, MAINE

THIS AGREEMENT entered into this 21 day of August, 1986 by and between the UNITED STATES OF AMERICA (hereinafter called the "Government"), represented by the Contracting Officer executing this Agreement, and the TOWN OF MACHIAS (hereinafter called the "Town"), acting by and through its Board of Selectmen, WITNESSETH THAT:

WHEREAS, construction of the Machias emergency streamline protection project on the Machias River in Machias, Maine, consisting of about 250 linear feet of stone slope protection to be placed in the tidal zone of the Machias River directly downstream from the Machias Falls (hereinafter called the "Project"), was approved by the Chief of Engineers on July 29, 1986, under authority granted by Section 14 of the 1946 Flood Control Act, Public Law 79-526 (33 U.S.C. 701r), as amended by Section 27 of the Water Resources Development Act of 1974, Public Law 93-251, approved 7 March 1974; and

WHEREAS, the Town hereby represents that it has the authority and capability to furnish the non-Federal cooperation required by the Federal legislation authorizing the project and by other applicable law.

NOW, THEREFORE, the parties agree as follows:

1. The Town agrees that if the Government shall commence construction of the emergency streambank protection project along the Machias River in Machias, Maine, substantially in accordance with the approval of the Chief of Engineers under authority of Section 14 of the 1946 Flood Control Act, Public Law 79-526, as amended, the Town shall in consideration of the Government commencing construction of such project fulfill the requirements of non-Federal cooperation specified in such legislation, to wit:

a. Provide, without cost to the Government, all lands, easements, rights-of-way and utility relocations necessary for project construction.

b. Hold and save the Government free from damages due to the construction, operation and maintenance of the project except where such damages are due to the fault or negligence of the Government or its contractors.

c. Maintain and operate the project after its completion without cost to the Government in accordance with regulations prescribed by the Secretary of the Army. Annual operation and maintenance costs are currently estimated to be $600.00.

d. Assume full responsibility for all costs in excess of the Federal statutory cost limitation of $250,000.00 to insure a complete, useful improvement. The Federal cost limitation includes costs of all investigation, planning, engineering, supervision, inspection and administration involved in development and construction. Current federal costs are estimated at $204,500.00.

e. Prevent future encroachment which might interfere with proper functioning of the project.

f. Comply with Section 601 of Title VI of the Civil Rights Act of 1964 (Public Law 88-352, 78 Stat. 241) to the end that no person shall be excluded from participation in, denied the benefits of or subjected to discrimination in connection with the project on the grounds of race, creed, or national origin.

g. Comply with the requirements of non-Federal cooperation specified in Sections 210 and 305 of Public Law 91-646, approved 2 January 1971, entitled "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970".

2. The Town hereby gives the Government a right to enter upon, at reasonable times and in a reasonable manner, lands which the Town owns or controls, for access to the project for the purpose of inspection. If inspection shows

that the Town for any reason is failing to operate, repair, manage or maintain the project in accordance with the assurances hereunder and has persisted in such failure after a reasonable notice in writing by the Government delivered to Town officials, then the Government may enter upon said lands to operate, repair, manage and/or maintain the project and bill the Town for costs incurred. No operation, repair, management or maintenance by the Government in such event shall operate to relieve the Town of responsibility to meet its obligations as set forth in paragraph 1 of this agreement, or to preclude the Government from pursuing any other remedy at law or equity.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

THE UNITED STATES OF AMERICA

By: _____

THOMAS A. RHEN
Colonel, Corps of Engineers
Division Engineer

Date: August 21, 1986

THE TOWN OF MACHIAS

By: _____

_____

_____

_____

_____

BOARD OF SELECTMEN

CERTIFICATION

I Wade Lancaster, certify that I am Counsel for the Town of Machias; that the Town of Machias is a legally constituted public body with full authority and legal capability to perform the terms of the agreement between the United States of America and the Town of Machias in connection with the above-described emergency streambank protection project and to pay damages, if necessary, in the event of the failure to perform in accordance with Section 221 of Public Law 91-611; and that the persons who have executed the contract on behalf of the Town of Machias have acted within their statutory authority.

IN WITNESS WHEREOF, I have made and executed this certificate this 21st day of August, 1986.

Wade Lancaster

Counsel for the Town of Machias

CERTIFICATION

I, Martha A. Bagley, do hereby certify that I am the Town Clerk of the Town of Machias, Maine, named herein; that Marc A. Nault, Carl Henderson, Edward R. Pellon, _____, and Aubrey V. Carter, who signed this agreement on behalf of the Town of Machias, were then and there the duly elected and qualified Selectmen of the Town of Machias; and that said agreement was duly signed for and on behalf of the Town of Machias by virtue of their statutory powers. I further certify that Daniel Lacasse, who approved the agreement, was Counsel for the Town.

IN WITNESS WHEREOF, I have hereunto affixed my hand and seal of the Town of Machias, this 21 day of August 1986.

Martha A. Bagley
Town Clerk

APPENDIX C

INSPECTION REPORT FORMS

DESIGNATION OF SUPERINTENDENT

Name Of Project: _____

Location: _____

MAINTAINING MUNICIPAL AGENCY:

Agency: _____

Address: _____ Tel. No. _____

"SUPERINTENDENT" - as required by Section 208.10 (a) (2), Chap II, Title 33 USC

Name & Title: _____

Employed by: _____

Business Address: _____

Business Tel. No: _____

Nights, Sundays, Address: _____

Nights, Sundays, Tel. No: _____

Remarks:

Signed _____

Title: _____

Date: _____

NOTE: To be submitted and updated as necessary by the responsible agency which will maintain and operate the works in accordance with regulations prescribed by the Secretary of the Army as required by law (Title 33, Chap. 208, Sec II, USC).

LOCAL FLOOD PROTECTION PROJECT INSPECTION REPORT

Project:

Maintaining Agency:

Type Inspection: _____Semi-Annual Staff ____90 Day Interim

River Basin: Date of Inspection

Feature	Sat	Unsat	Deficiencies
PUMPING STATIONS - STRUCTURES			
INTERIOR			
EXTERIOR			
PUMPS - MOTORS - ENGINES			
TRIAL OPERATED			
GENERAL CONDITION			
POWER SOURCE			
INSULATION TESTS			
METAL INTAKES/OUTLETS			
GATE VALVES			
GATES - DRAINAGE STRUCTURES			
TRIAL OPERATED			
GENERAL CONDITION			
LUBRICATION			
GENERAL CONDITION			
SLOPES/EROSION			
SAND BOILS/CAVING			
TRESPASSING			
SLOPE PROTECTION			
DRAINS			
STOP-LOGS - LOG BOOM			
CONDITION OF LOGS			
AVAILABILITY OF LOGS			
HIGHWAY SLOTS			
STORAGE FACILITIES			
CHANNELS - OUTLET WORKS CHANNEL			
BANKS			
OBSTRUCTION CONTROL			

NED FORM JAN. 66 513

Feature	Sat	Unsat	Deficiencies
CONCRETE STRUCTURES			
SURFACE			
SETTLEMENT			
JOINTS			
DRAINS			
MISCELLANEOUS			
EMERGENCY OPER. PLAN			
EMERGENCY EQUIPMENT			
SEMI-ANNUAL REPORT			

Inspection Party:

Photographs Taken:

Remarks & Additional Comments:

(Indicate Here Observations, Discussions, Specific Feature Deficiencies, Recommendations and any other pertinent information. Use Continuation Sheet if necessary.)

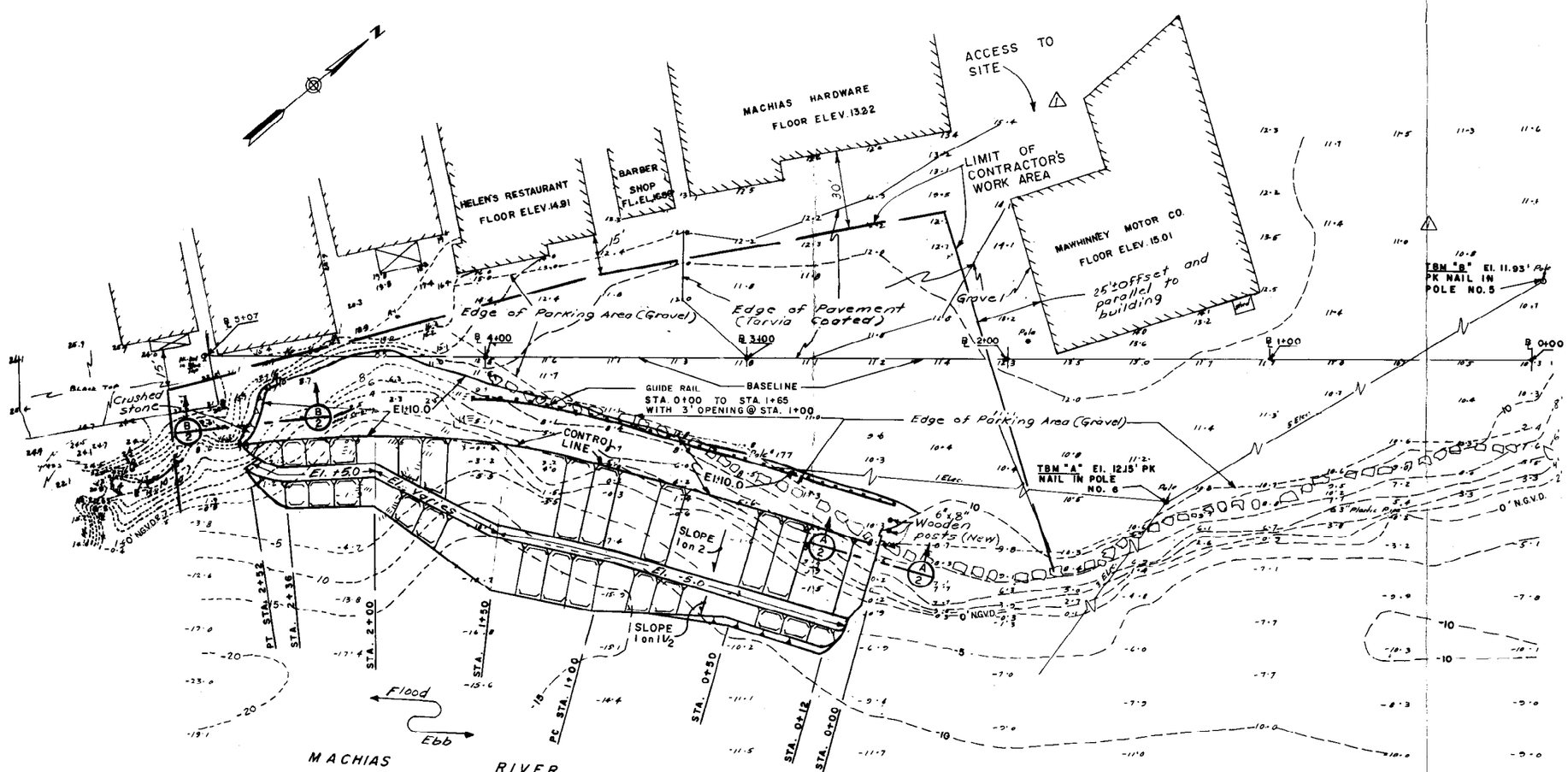
X ALL APPLICABLE ITEMS. IF UNSAT INDICATE SPECIFIC DEFICIENCIES. INDICATE IF NOT APPLICABLE.

DATE	INSPECTED BY: TYPED NAME & TITLE	SIGNATURE

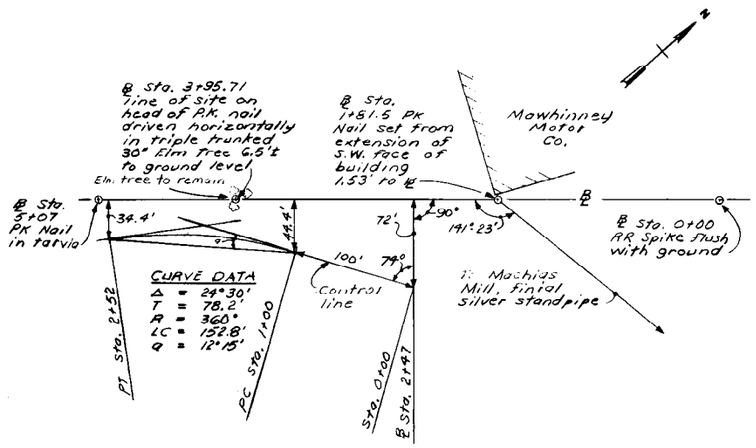
APPENDIX D

AS-BUILT DRAWINGS

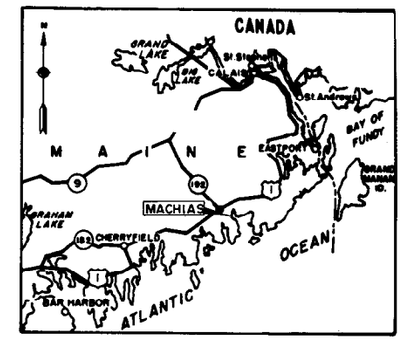
CORPS OF ENGINEERS — U. S. ARMY



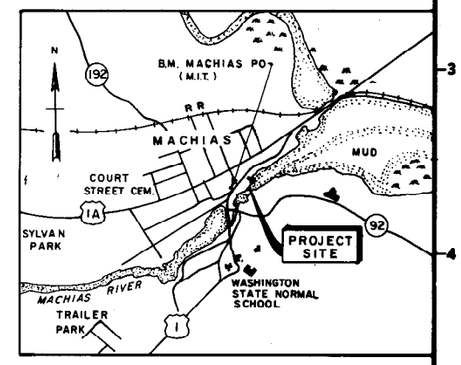
PLAN
SCALE: 1" = 20'



HORIZONTAL CONTROL DATA
SCALE: 1" = 50'



LOCATION MAP
SCALE IN MILES 10 0 10 20



VICINITY MAP
NTS

NOTES:

1. Elevations are in feet and refer to the National Geodetic Vertical Datum of 1929 (N.G.V.D.)
2. The contours shown here refer to the conditions at the time the surveys were performed. The contour interval is 2 feet for topography above 0.0' N.G.V.D. and 5 feet for elevations below 0.0' N.G.V.D.
3. Date of surveys: April 80 and April 86; Fieldbook FC-369.
4. B.M. Machias PO (M.I.T.): Near the intersection of Main and Central Streets, at the old Post Office Building; 129 Feet west of the west curb of Central Street, 8.8 feet north of the north curb of Main Street, about 3 feet above the level of the sidewalk, and set vertically in the granite portion of the South wall near the southeast corner of the building. Elevation is +33.491 feet N.G.V.D.

INDEX TO DRAWINGS

DRAWING NO.	SH. NO.	TITLE
MAC - 1	1	PLAN AND INDEX
" "	2	SECTIONS AND DETAIL

As Built Drawing
Contract No. DACW 33-86-C-0040

VALUE ENGINEERING PAYS DIVIDENDS

SAFETY PAYS

GRAPHIC SCALES
1" = 20' — 20' 0 20' 40'
1" = 50' — 50' 0 50' 100'

REVISION	DATE	DESCRIPTION	BY
1	8-19-86	Access and contractor's work area revised (Am. #1)	PBR

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY PBR | DR. BY RF | CK. BY PBR

SUBMITTED: CHIEF, COAST ENG./SUR SECT

APPROVAL RECOMMENDED: CHIEF, DESIGN BRANCH

REVIEWED: PROJECT MANAGER

APPROVAL RECOMMENDED: CHIEF, PROJECT MNGT. BRANCH

WATER RESOURCES DEVELOPMENT PROJECT
MACHIAS, MAINE
EMERGENCY STREAMBANK PROTECTION
MACHIAS RIVER
PLAN AND INDEX

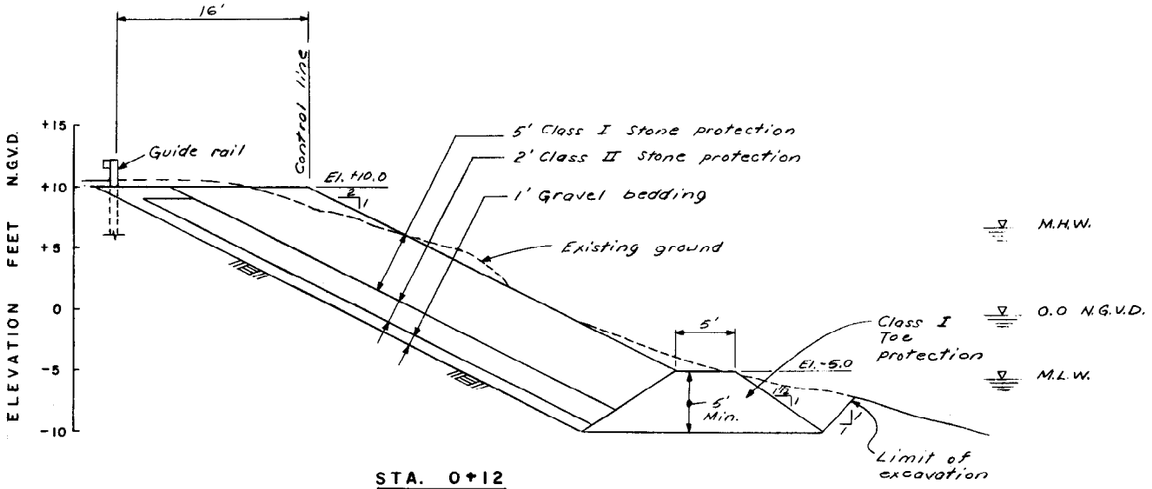
APPROVED: CHIEF, ENGINEERING DIVISION — DATE AUG. 1986

SCALE: AS SHOWN | SPEC. NO. DACW33-86-B-0053

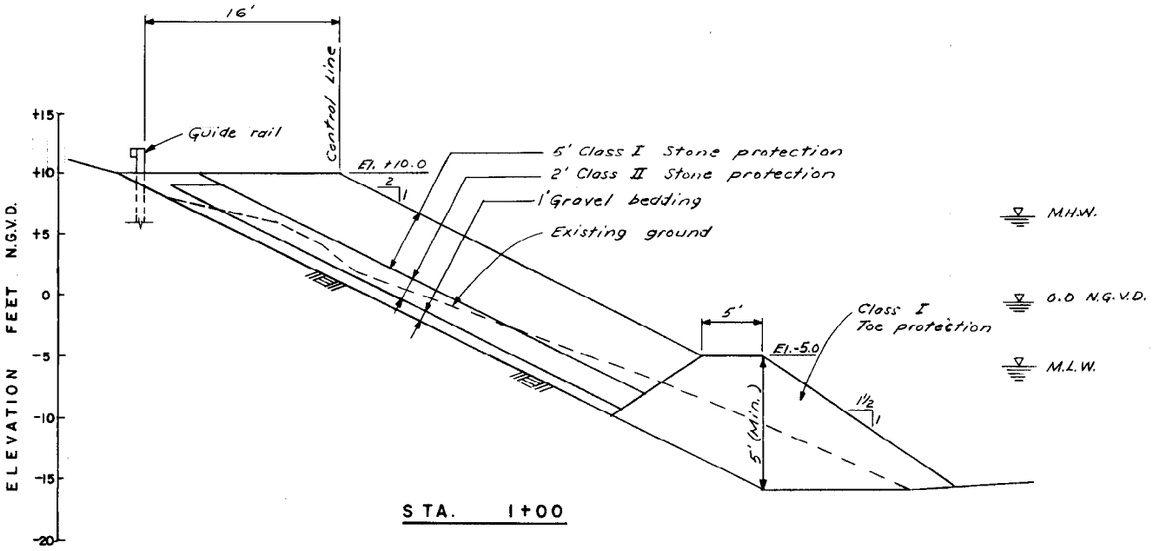
DRAWING NUMBER
MAC - 1

SHEET 1 of 2

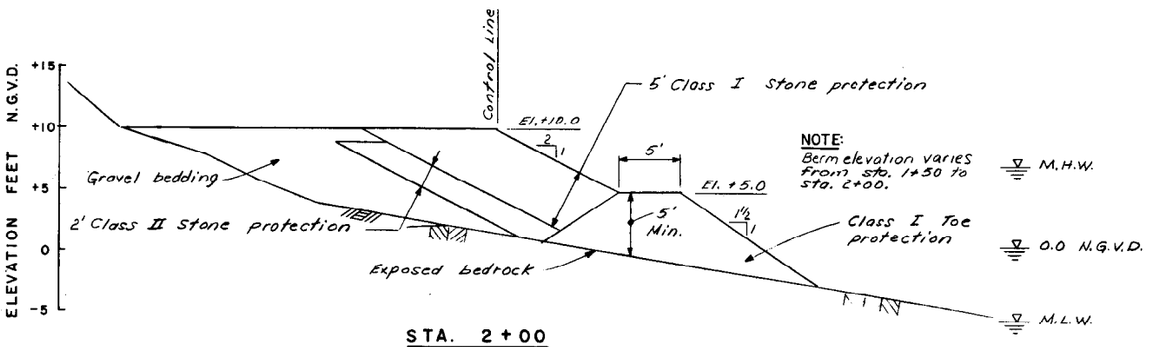
CORPS OF ENGINEERS — U. S. ARMY



STA. 0+12



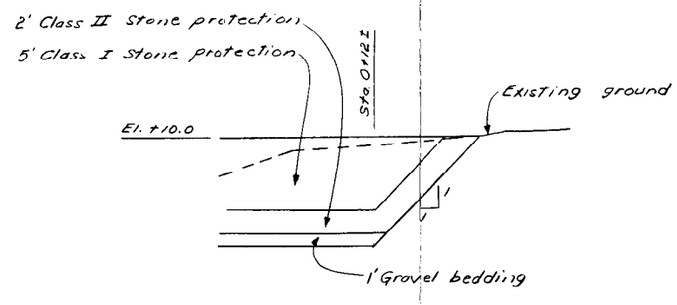
STA. 1+00



STA. 2+00

SECTIONS

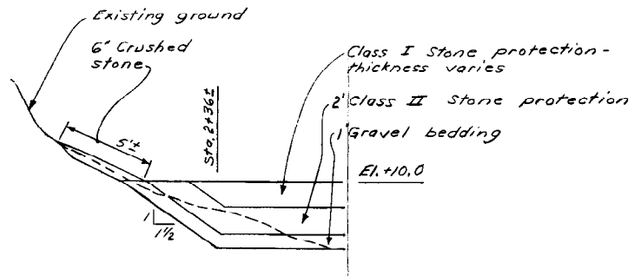
SCALE: 1" = 5'



SECTION A/1

DOWNSTREAM END SECTION

N.T.S.

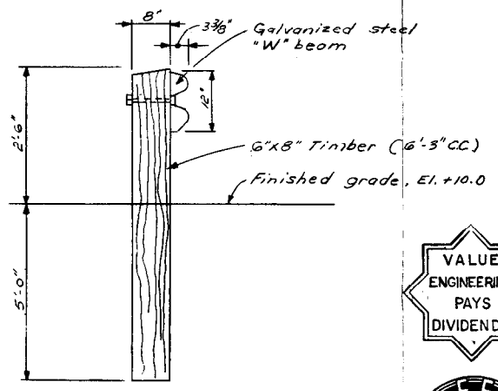


SECTION B/1

UPSTREAM END SECTION

N.T.S.

NOTE:
For general notes see sheet 1 of 2.



GUIDE RAIL DETAIL

N.T.S.

VALUE ENGINEERING PAYS DIVIDENDS

SAFETY PAYS

GRAPHIC SCALES

1"=5' 5' 0 5' 10'

As Built Drawing
Contract No. DACW 33-86-C-0040

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY	DR. BY	CK. BY
PSC	R.F.	JPM

SUBMITTED: CHIEF, COAST ENG./SUR. SECT.
APPROVAL RECOMMENDED: CHIEF, DESIGN BRANCH
REVIEWED: PROJECT MANAGER
APPROVAL RECOMMENDED: CHIEF, PROJECT MNGT. BRANCH

WATER RESOURCES DEVELOPMENT PROJECT
MACHIAS, MAINE
EMERGENCY STREAMBANK PROTECTION
MACHIAS RIVER
SECTIONS AND DETAIL

APPROVED: CHIEF, ENGINEERING DIVISION
DATE: AUG. 1986

SCALE: 1" = 5' | SPEC. NO. DACW33-86-B-0053
DRAWING NUMBER
MAC - 1
SHEET 2 of 2